

Long-Term Secular Trends in Initiation of Cigarette Smoking Among Hispanics in the United States

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Synopsis

Preventing the initiation of cigarette smoking plays a vital role in reducing rates of cigarette smoking. The authors investigated trends in cigarette smoking initiation among Mexican Americans, Cuban Americans, Puerto Rican Americans, compared with whites, by examining the cigarette

smoking histories of adults from the 1982-83 Hispanic Health and Nutrition Examination Survey and the 1987 National Health Interview Survey. To evaluate these trends, they calculated the prevalence of cigarette smoking among 20-24-year-olds, an indicator of the rate of smoking initiation, in successive 5-year birth cohorts from 1908-12 to 1958-62 among Hispanics and from 1908-12 to 1963-67 among whites.

Recently, rates of smoking initiation among Mexican American and Cuban American men have declined and converged with rates of initiation among white men. However, rates of initiation among Puerto Rican American men appeared to have remained unchanged since the 1950s. During the 1970s rates of smoking initiation among Cuban American and Puerto Rican American women surpassed those of white women. In the early 1980s, however, rates of initiation among these groups of Hispanic women have declined to levels comparable to or perhaps lower than the rates among white women. Although recently the rates among Mexican American women have been the lowest of all groups of women, they have not experienced appreciable declines.

In general, rates of smoking initiation either declined or leveled off later for Hispanics than for whites. These results suggest that Hispanics tended to follow the smoking trends observed among whites and that special efforts are needed to prevent cigarette smoking among Hispanics.

RECENTLY PUBLISHED REPORTS have suggested that preventing the initiation of cigarette smoking must be a top priority in the battle to combat smoking (1). In contrast to cigarette smoking cessation, little progress has been made over the past decade in preventing the initiation of smoking, particularly among women and among people with little education (2). Moreover, because of the strong addictive potential of nicotine, adolescents who begin to smoke find quitting extremely difficult.

We, therefore, assumed that Hispanics, who tend to have fewer years of schooling than whites, may have higher rates of initiation to smoking. Moreover, because of the particularly large number of young Hispanics (3), the number of new Hispanic smokers may indeed be great. Unfortunately, little

information about smoking initiation among Hispanics is available (4-7). Therefore, to evaluate initiation of cigarette smoking among Mexican American, Cuban American, and Puerto Rican American men and women, we retrospectively analyzed data on smoking histories from the Hispanic Health and Nutrition Examination Survey (HHANES). For comparison, we evaluated initiation rates among white Americans by using data from the 1987 National Health Interview Survey (NHIS).

Methods

HHANES survey design. Details of the HHANES survey sample design, as well as the plan of operation, selection process, data collection, and

quality control, are presented elsewhere (8). In brief, HHANES used a stratified, four-stage, probability sample of persons. The four stages of selection were (a) counties or small groups of adjacent counties making up the primary sampling units, (b) clusters of households making up the segments, (c) households, and (d) persons. Because the Cuban American sample included only Dade County, FL, this sample had a three-stage selection procedure. Although the areas sampled in HHANES do not represent all Hispanics in the nation, these areas include a substantial percentage of all Hispanics in the United States (8).

NHIS survey design. Details of the NHIS survey sample design, as well as the plan of operation, selection process, data collection, and quality control, are presented elsewhere (9). In brief, NHIS used a multistage probability design that permitted continuous sampling of the civilian noninstitutionalized population residing in the United States. The four stages of selection were (a) a county, small groups of adjacent counties, or a metropolitan statistical area making up the primary sampling units, (b) clusters of geographically defined households making up the segments, (c) households, and (d) persons.

Data collection in HHANES and NHIS. Demographic and smoking information were composed of data collected from Hispanics (20–74 years of age) and whites (20–79 years of age). Interviewees were asked, “Have you smoked at least 100 cigarettes in your entire life?” Those who answered “yes” to this question were considered “ever smokers” and were asked, “How old were you when you first started smoking cigarettes fairly regularly?” Responses to this question were used to determine the age when the respondent began smoking. Former smokers were asked, “About how long has it been since you last smoked cigarettes fairly regularly?” Responses to this question were used to determine the age at which the respondents quit smoking.

Defining the study population in HHANES. For the HHANES, 7,100 adults (4,218 Mexican Americans, 1,193 Cuban Americans, and 1,689 Puerto Rican Americans) were interviewed. We excluded from the analysis 502 adults who were not Hispanic. Non-Hispanics were persons whose race or ethnic background was other than Mexican American in the Southwest, Cuban American in Dade County, or Puerto Rican American in the New

York City area but who had been selected in the sample. Of the remaining 6,598 adults, 4 had missing smoking data, and 110 either had unknown values for smoking variables or smoked irregularly. Because the analysis focused on data from 5-year birth cohorts from 1908 to 1962, 140 persons born in other years were excluded. Thus, 6,344 adults were included in this analysis.

Defining the study population in NHIS. For the epidemiologic study NHIS, 22,080 adults were interviewed. Of these people, 3,682 who were not white and 1,079 who were Hispanic were excluded from the analysis. Of the remaining 17,319 adults, 555 either had unknown values for smoking variables or smoked irregularly. Because the analysis focused on data from 5-year birth cohorts from 1908 to 1967, 1,454 persons born in other years were excluded. Thus, 15,310 adults were included in this analysis.

Analysis. Investigators recently evaluated rates of smoking initiation among white men and women by using the cigarette smoking prevalence rates among 20- to 24-year-olds (10). We adopted the same criteria to define smoking initiation, except that our estimates were calculated retrospectively since estimates of current cigarette smoking among 20–24-year-old Hispanic Americans before 1982 are unavailable.

The following explains how estimates were obtained. First, we defined 5-year birth cohorts (1908–12, 1913–17, 1918–22, 1923–27, 1928–32, 1933–37, 1938–42, 1943–47, 1948–52, 1953–57, 1958–62, and 1963–67) of men and women in each race-ethnic group. Second, we defined the year in which each member of the 5-year cohort reached 20–24 years. Members of the 1908–12 birth cohort, for example, were 20–24 years old in 1932. The next oldest 5-year birth cohort (the 1913–17 birth cohort) reached ages 20–24 years 5 years later in 1937. In the same manner, each successive 5-year birth cohort reached 20–24 years of age 5 years after the previous 5-year birth cohort. Third, we calculated the prevalence of cigarette smoking among 20–24-year-olds in successive birth cohorts. For any cohort, smoking prevalence rates were calculated by using each person’s smoking history. The numerator represented the number of 20–24-year-olds who smoked, and the denominator represented all 20–24-year-olds in the 5-year birth cohort (7).

The sampling weight for each respondent was used to provide correct estimates of smoking prevalence among Mexican Americans in the five south-

western States, Cuban Americans in Dade County, FL, Puerto Rican Americans in the New York City area, and white Americans in the United States. Because of the manner in which birth cohorts were defined, the prevalences of smoking obtained were from 1932 to 1982 among Hispanics and from 1932 to 1987 among whites. These prevalence rates gave us estimates of the rate of smoking initiation. Finally, we plotted these estimates to assess trends in smoking initiation among each of the eight race-ethnic and sex groups in the surveys—Mexican American, Cuban American, Puerto Rican American, and white American men and women.

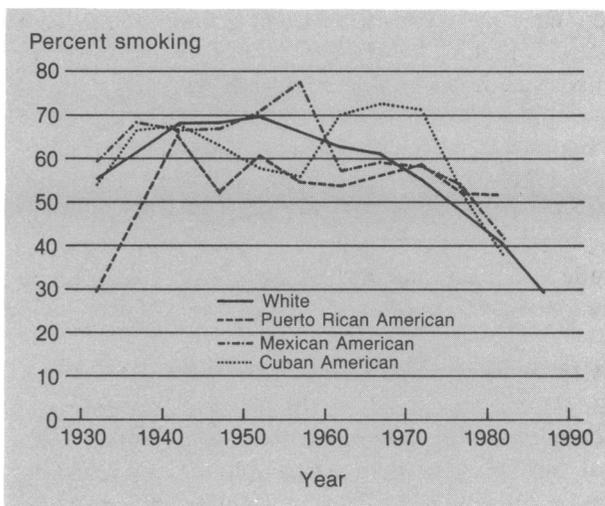
Results

Figure 1 shows estimates of smoking initiation, based on the prevalence of ages 20–24 years, from 1932 to 1982 among Hispanic men and from 1932 to 1987 among white men. These curves indicate that initiation rates among all ethnic groups increased during the 1930s, were followed by a period in which these rates either continued to increase slightly among Mexican American and Cuban American men or leveled off among white and Puerto Rican American men. Finally, during the 1970s and 1980s, rates declined among all groups of men except Puerto Rican Americans. Initiation rates among white men, however, began to decline as early as the 1950s. During this decade, initiation rates among Mexican American and Cuban American men increased.

Initiation rates began to decline in the latter part of the 1950s among Mexican American men and in the early 1970s among Cuban American men. Rates among Puerto Rican American men have yet to decline. Whereas initiation rates were either comparable or lower among Hispanic men compared with white men during the first two decades of observation, peak initiation rates were higher among Mexican American men during the 1950s and in the 1960s among Cuban American men.

Figure 2 shows estimates of smoking initiation from 1932 to 1982 among Hispanic women and from 1932 to 1987 among white women. These curves indicate that initiation rates among all ethnic groups of women increased during the decades of the 1930s, 1940s, and the 1950s, but were followed by a period when these rates either increased among Cuban American and Puerto Rican American women or leveled off among white women. Rates among Mexican American women did not decline appreciably since peaking in the early 1960s. Rates appeared to decline among Cuban

Figure 1. Smoking prevalence among men ages 20–24¹ in the Hispanic Health and Nutrition Examination Survey and the National Health Interview Survey



¹ Smoking prevalence used as an indicator of smoking initiation.

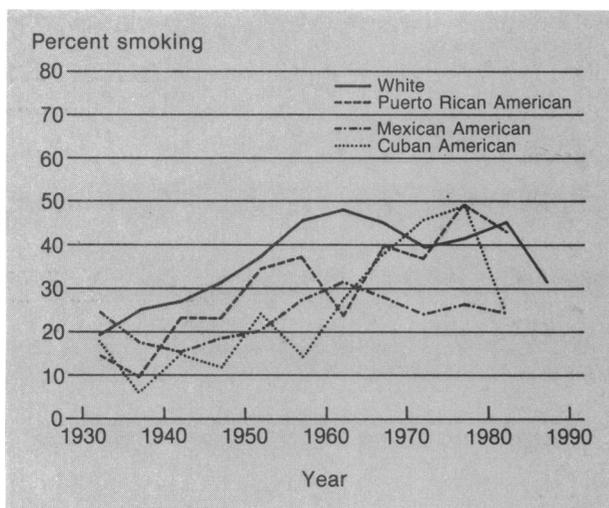
American and Puerto Rican American women in the late 1970s and among white women in the early 1980s. Whereas initiation rates were clearly lower among Hispanic women compared with white women from the mid 1930s to the 1960s, initiation rates among Cuban American and Puerto Rican American women have been comparable to rates among white women since the mid 1960s. Rates of Mexican American and white women closely paralleled each other since the 1940s, although rates among white women have been substantially higher.

Discussion

Recently, rates of smoking initiation among Mexican American and Cuban American men have declined and converged with rates of initiation among white men. However, rates of initiation among Puerto Rican American men appeared to have remained unchanged since the 1940s. During the 1970s, rates of smoking initiation among Cuban American and Puerto Rican American women surpassed those of white women. Most recently, however, rates of initiation among these two groups of Hispanic women have declined to levels comparable to or perhaps lower than the rates among white women. Although the rates among Mexican American women have recently been the lowest of all groups of women, they have not experienced the declines observed among other groups.

Several potential biases in this retrospective anal-

Figure 2. Smoking prevalence among women ages 20-24¹ in the Hispanic Health and Nutrition Examination Survey and the National Health Interview Survey



¹ Smoking prevalence used as an indicator of smoking initiation.

ysis need to be considered (7,11). First, because smokers were more likely to die than nonsmokers, smokers were less likely to be included in the survey. The estimated smoking prevalence would therefore be less than the actual smoking prevalence since the estimated prevalence reflected the smoking habits of those interviewed. Data from another analysis, however, suggested that this bias existed to an appreciable degree only among birth cohorts before and including the 1901-10 cohort (11). Because we included data from 1908 on, our findings were probably not appreciably biased by differential mortality. Second, older persons may have been less likely than younger ones to recall accurately dates of smoking initiation. Although this recall bias may have affected comparisons between older and younger cohorts, comparisons between men and women or between ethnic groups in comparable cohorts would be unaffected.

The sample sizes among Cuban Americans were especially small in the younger age groups. Therefore, recent trends in initiation among Cuban Americans should be interpreted with caution. For example, the recent dramatic decline in rates of initiation among Cuban American men and women might be a result of the large variability in the 1982 estimates.

Because the smoking prevalence reached at 24 years used in this study was the indicator of smoking initiation, any smoking initiation that might have occurred after age 24 might have given rise to lower estimates of initiation. For example, birth cohort analysis suggests that the smoking

initiation experience of Hispanic women and of women in the general population who were 24 years old before 1960 was incomplete by that age (7,11). The initiation experience of Hispanic men and men in the general population who were 24 years old before 1950 was also incomplete by that age (7,11).

The difference between smoking prevalence at 24 years and the smoking prevalence at completion of smoking initiation was between 5 or less and 15 prevalence points for all groups, the greater differences being among women and among older birth cohorts. The estimates of smoking initiation we obtained, based on smoking prevalence rates at 24 years, therefore, were slightly reduced among women before 1960 and among men before 1950. Also, increases in the rates of smoking initiation observed among all groups of women were thus slightly overestimated. However, trends in smoking initiation among men or comparisons among groups of women were not altered appreciably. More importantly, recent trends in smoking initiation remain since smoking prevalence among 20-24-year-old Hispanic women has been a reliable indicator of smoking initiation since 1960. Major trends identified in this study still apply since these were based on estimates of smoking initiation observed within the last 20 years.

Rates of smoking initiation among Hispanic men declined later than the declines observed among white men. As a result, the rates of initiation among Hispanic men were slightly higher than white men during the 1970s. The reasons for these differences are unclear. Possibly, white men set the "trend" in cigarette smoking, which Hispanic men then followed. Another explanation may be that as the tobacco market among white men began to shrink, Hispanic men were targeted by tobacco companies for advertisements (12). Finally, public health messages regarding the health effects of cigarette smoking may have been more effective in reaching white men compared with Hispanic men.

Smoking initiation among Puerto Rican American men has not declined as in other groups of men. Lack of educational experiences (2), low social standing, and poor access to health information for Hispanics in the New York area may be contributing factors.

The convergence of cigarette smoking initiation rates between men and women may have occurred as a result of changing male-female roles—the social emancipation of women. That is, cigarette smoking among women did not decline at a time when rates declined markedly among men, suggest-

ing that the social attitudes during and following the 1960s that resulted in greater freedom for women also may have resulted in both white and Hispanic women asserting their greater freedom to smoke cigarettes. The increase in initiation rates during the 1960s of both Cuban American and Puerto Rican American women supports this hypothesis. Findings from a study of Hispanics in the San Francisco area also support this hypothesis. In that study, acculturated Hispanic women were more likely to smoke than other Hispanic women (13).

During the 1960s and 1970s, the rates of smoking initiation among Puerto Rican American women increased rapidly. During the same period, rates of initiation among white women had peaked and begun to decline. The reasons for these differences may be many. First, fewer years of schooling (2) may have contributed to high rates of initiation among Hispanics. A desire to acculturate may have been expressed by adopting cigarette smoking among some Puerto Rican American women (13). For example, in a 1982 survey, the prevalence of cigarette smoking among women in Puerto Rico was 15.3 percent, whereas the rate among Puerto Rican American women residing in the United States was 32.6 percent (7,14). This difference suggests that a large part of the higher smoking prevalence of Puerto Rican American women was the result of the higher rates of smoking initiation observed here and that acculturation or other behavioral adaptations that followed immigration might have played a role.

Recently, public health efforts, such as targeting the high school class graduating in the year 2000 as the smoke-free class, have begun to prioritize smoking prevention among youth. The smoking initiation data from HHANES indicate that these efforts are needed among Hispanics also. In addition, the differences in the rate and trends of cigarette smoking initiation between Hispanics and whites suggest that more studies are needed to improve understanding of smoking initiation among Hispanics. This understanding may be particularly important for Puerto Rican American men and women because of their continued high rates of smoking initiation. In the future, this understanding may also be of special importance to Mexican American women because their rates of initiation have not declined appreciably. In any case, more information about the determinants of smoking initiation is needed to design culturally appropriate public health messages intended to deter Hispanics from starting to smoke.

References.....

1. Pierce, J. P., et al.: Trends in cigarette smoking in the United States: projections to the year 2000. *JAMA* 261: 61-65, Jan. 6, 1989.
2. Pierce, J. P., et al.: Trends in cigarette smoking in the United States: educational differences are increasing. *JAMA* 261: 56-60, Jan. 6, 1989.
3. Trevino, F. M., and Moss, A. J.: Health indicators for Hispanic, black, and white Americans. *Vital Health Stat [10]* No. 148. DHHS Publication No. (PHS) 84-1576. National Center for Health Statistics, Hyattsville, MD, 1984.
4. Holck, S. E., Warren, C. W., Roach, R. W., and Smith, J. C.: Lung cancer mortality and smoking habits: Mexican-American women. *Am J Public Health* 72: 38-42 (1982).
5. Humble, C. G., Samet, J. M., Pathak, R. R., and Skipper, B. J.: Cigarette smoking and lung cancer in New Mexico's Hispanics and anglos. *Am J Public Health* 75: 145-148 (1985).
6. Markides, K. S., Coreil, J., and Ray, L. A.: Smoking among Mexican Americans: a three-generation study. *Am J Public Health* 77: 708-711 (1987).
7. Escobedo, L. G., and Remington, P. L.: Birth cohort analysis of prevalence of cigarette smoking among Hispanics in the United States. *JAMA* 261: 66-69, Jan. 6, 1989.
8. National Center for Health Statistics: Plan and operation of the Hispanic Health and Nutrition Examination Survey, 1982-84. *Vital Health Stat [1]*, No. 19. DHHS Publication No. (PHS) 85-1321. Hyattsville, MD, 1985.
9. Kovar, M. G., and Poe, G. S.: The National Health Interview Survey design, 1973-84, and procedures, 1975-83. *Vital Health Stat [1]* No. 18. DHHS Publication No. (PHS) 85-1320. National Center for Health Statistics, Hyattsville, MD, 1985.
10. Fiore, M. C., et al.: Trends in cigarette smoking in the United States: the changing influence of gender and race. *JAMA* 261: 49-55, Jan. 6, 1989.
11. Harris, J. E.: Cigarette smoking among successive birth cohorts of men and women in the United States during 1900-80. *JNCI* 71: 473-479 (1983).
12. Davis, R. M.: Current trends in cigarette advertising and marketing. *N Engl J Med* 316: 725-732, Mar. 19, 1987.
13. Marin, G., Perez-Stable, E. J., and Marin, B. V.: Cigarette smoking among San Francisco Hispanics: the role of acculturation and gender. *Am J Public Health* 79: 196-197 (1989).
14. Becerra, J. E., and Smith, J. C.: Maternal smoking and low birthweight in the reproductive history of women in Puerto Rico, 1982. *Am J Public Health* 78: 268-272 (1988).